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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,131	07/31/2003	Laurel H. Carney	156 P 023	2472
28264	7590	10/01/2004	EXAMINER	
BOND, SCHOENECK & KING, PLLC ONE LINCOLN CENTER SYRACUSE, NY 13202-1355			NATALINI, JEFF WILLIAM	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,131

Applicant(s)

CARNEY ET AL.

Examiner

Jeff Natalini

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/27/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: see attached

Specification

The disclosure is objected to because of the following informalities:

- If applicant would like claim priority to provisional application 60/400,357, it must be listed at the beginning of the specification (it will need to be listed after the claim to priority of provisional application 60/400359 already in the specification).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being obvious over “A New Angle on Detection: A Physiological Model for the Detection of Tones in Noise”, by Carney et al. (herein to be referred to as Carney et al.) in view of Fullerton et al. (6031862).

In regard to claims 1 and 2, Carney et al. discloses a system for detecting a signal having a target frequency (introduction paragraph) comprising: a first filter having a first center frequency and a first transfer function, wherein said first center frequency is greater than said target frequency (figure of phase vs frequency on pg 1 shows a first filter having a center frequency lower then the target frequency of 900Hz); a second filter having a second center frequency and a second transfer function, wherein said

second center frequency is less than said target frequency (figure of phase vs frequency on pg 1 shows a second filter having a center frequency higher than the target frequency of 900Hz) and wherein the phases of said first and second transfer functions differ by 180 degrees about said target frequency (last sentence on pg 1).

Carney et al. lacks wherein a running cross-correlator is interconnected to said first and second filters for comparing first and second transfer functions over time; wherein the running correlator comprises a cross-correlator having a predefined integration time interconnected to a low pass filter having a frequency that is inversely proportional to the integration time of said cross-correlator.

Fullerton et al. teaches a running cross-correlator interconnected to said first and second filters (fig 24- Cross-correlator (1408), low pass filter (1428)) for comparing first and second transfer functions over time (col 17 line 39-45; the transfer function signals are similar to these signals as they change over time); wherein the running correlator comprises a cross-correlator having a predefined integration time interconnected (col 17 line 39-45) to a low pass filter (fig 224- Cross-correlator (1408), low pass filter (1428); col 17 line 52-57) having a frequency that is inversely proportional to the integration time of said cross-correlator (col 9 line 60-66).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to incorporate a running cross-correlator having a predefined integration time interconnected to a low pass filter having a frequency that is inversely proportional to the integration time of said cross-correlator as taught by Fullerton et al. in order to pull the signal out of the surrounding noise (col 17 line 44-45).

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al. in view of Fullerton et al. (6031862) as applied to claim 2 above, and further in view of Minto (5757641).

In view of claims 3 and 4, Carney et al. and Fullerton et al. lack first and second non-linearities interconnect first and second filter to the cross-correlator; wherein the non-linearities are signum functions.

Minto discloses that each filter comprises a signum function coupled to it (fig 3 (147-filter) (143-signum function)), in order to perform the computation converting each signal to a (+1), (-1), or zero, thus performing a non-linear function to the signal (col 5 line 28-42).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. and Fullerton et al. to have a signum function perform a non-linear function on the output of each filter as taught by Minto in order to receive the local channel residual error signal (col 5 line 28-31).

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al. in view of Fullerton et al. (6031862) and further in view of Minto (5757641) and further in view of Franklin et al. (4363138).

In regard to claims 5-7, Carney et al. discloses a method for detecting a signal having a target frequency in noise (introduction paragraph) comprising: a first filter having a first center frequency and a first transfer function, wherein said first center

frequency is greater than said target frequency (figure of phase vs frequency on pg 1 shows a first filter having a center frequency lower then the target frequency of 900Hz); a second filter having a second center frequency and a second transfer function, wherein said second center frequency is less than said target frequency (figure of phase vs frequency on pg 1 shows a second filter having a center frequency higher then the target frequency of 900Hz) and wherein the phases of said first and second transfer functions differ by 180 degrees about said target frequency (last sentence on pg 1).

Carney et al. lacks processing the outputs of the filters with saturating non-linearity component that is a signum function; running cross-correlator is interconnected to said the output of the non-linear output; wherein the running correlator comprises a cross-correlator having a integration time determined by a low pass filter; and determining if the signal is present when said running cross-correlation drops below a predetermined threshold.

Minto discloses that each filter comprises a signum function coupled to it (fig 3 (147-filter) (143-signum function)), in order to perform the computation converting each signal to a (+1), (-1), or zero, thus performing a non-linear function to the signal (col 5 line 28-42).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to have a signum function perform a non-linear function on the output of each filter as taught by Minto in order to receive the local channel residual error signal (col 5 line 28-31).

Fullerton et al. teaches a running cross-correlator interconnected to said first and second filters (fig 24- Cross-correlator (1408), low pass filter (1428); col 17 line 39-45); wherein the running correlator comprises a cross-correlator having a integration time determined by a interconnected low pass filter (fig 224- Cross-correlator (1408), low pass filter (1428); col 17 line 52-57).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to incorporate a running cross-correlator having a integration time dependant on a interconnected low pass filter as taught by Fullerton et al. in order to pull the signal out of the surrounding noise (col 17 line 44-45).

Franklin et al. discloses a threshold detector that connected to the output of a cross-correlator (fig 2 (28-cross-correlator) (29-threshold detector)) and will be able to recover the signal by comparing the output of the cross-correlator to the threshold value (col 5 line 10-19; it is known in the art the original signal would have a lower value after cross correlation therefore be detected when under the threshold value).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to use a threshold detector to determine the original signal when the cross correlation drops below a threshold as taught by Franklin et al. in order to minimize false alarm probabilities (col 3 line 25-27).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bond (5631877) teaches recovering a narrowband signal in

noise and provides an amplitude transformation (non-linearity) in the procedure.


"Auditory Phase Opponency: A Temporal Model for Masked Detection at Low Frequencies" by Carney et al. (being a different inventive entity than instant invention) teaches a model for tone-in-noise detection that includes having two filters phases 180 degrees apart.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 571-272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



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